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The Herminiine Moths of the Genus *Hadennia* (Noctuidae) from Japan, with Reference to their Distribution in the Kii Peninsula

By

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のガと紀伊半島における分布

The genus *Hadennia* is a group of medium-sized herminiine moths with specialized brush-organs in the male labial palpi. In my previous paper (1978), I tentatively listed the three Japanese species of this genus, two of them having been misidentified and the remaining one left as an undescribed species.

As a part of the Natural History Research Project of the Japanese Islands conducted by the National Science Museum, Tokyo, I made light-trap surveys for collecting nocturnal insects at two localities of the Kii Peninsula in June and July, 1978. During the survey I was able to obtain many examples of *Hadennia* species, most of which belonged to nothing but the undescribed species.

Taking this opportunity, I am going to describe and redescribe all the species of *Hadennia* known from Japan, and to give accounts of their distributions for clarifying certain characteristics of the moth fauna of the Kii Peninsula.

Hadennia MOORE, 1885

Hadennia MOORE, 1885, Lepid. Ceylon, 3 (for 1887): 236; type-spceis: *Bocana hypenalis* WALKER, 1859 (=*Bocana jutalis* WALKER, 1859), by original designation.

Antenna in male ciliate, with a pair of long bristles on each segment, the bristles on the outer side of antenna being longer than the inner ones; usually with a knot at the middle of shaft (Fig. 1), the knot consisting of about 6 segments broadened and flattened, dorsally covered with a tuft of long hairs; shaft twisted beyond the knot; in the male of *nakatanii* n. sp. (Fig. 2), knot absent and shaft not twisted; in female ciliate, with a pair of bristles which are shorter than in male, without knot. Labial palpus in male usually modified as follows (Figs. 3, 4): 1st segment short; 2nd segment long, upcurved along frons and vertex; 3rd segment about a half as long as 2nd, ovate; with tufts of ochreous long hairs arising from

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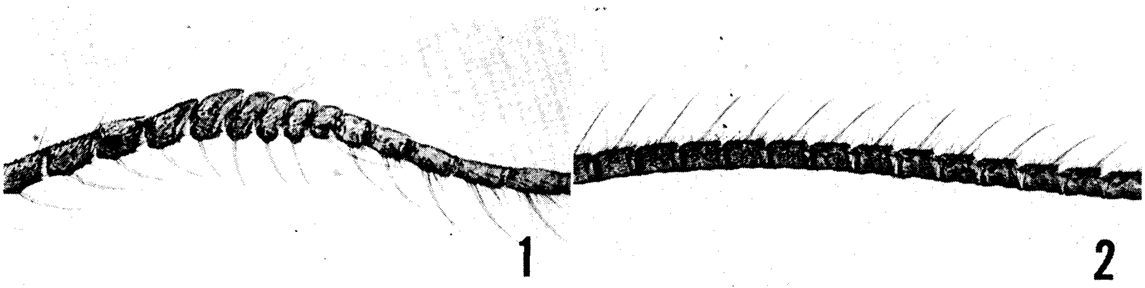
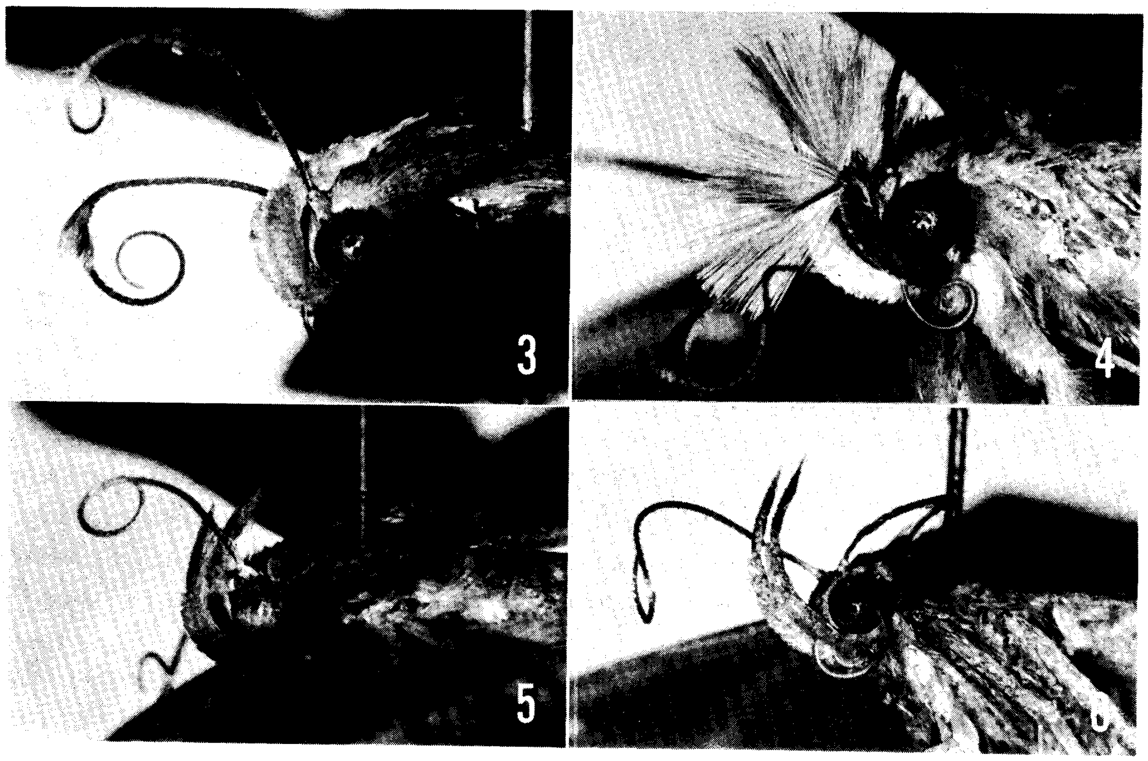




Figs 1–2. Male antenna, scales removed.——1. *Haednnia incongruens* (BUTLER).——2. *Hadennia nakatanii*, n. sp.

Figs. 3–6. Head.——3–4. Male head of *Hadennia incongruens* (BUTLER); tufts of hairs of labial palpi concealed (3), and tufts of hairs of labial palpi exposed (4).——5. Male head of *Hadennia nakatanii*, n. sp., tufts of hairs of labial palpi wanting.——6. Female head of *Hadennia incongruens* (BUTLER).

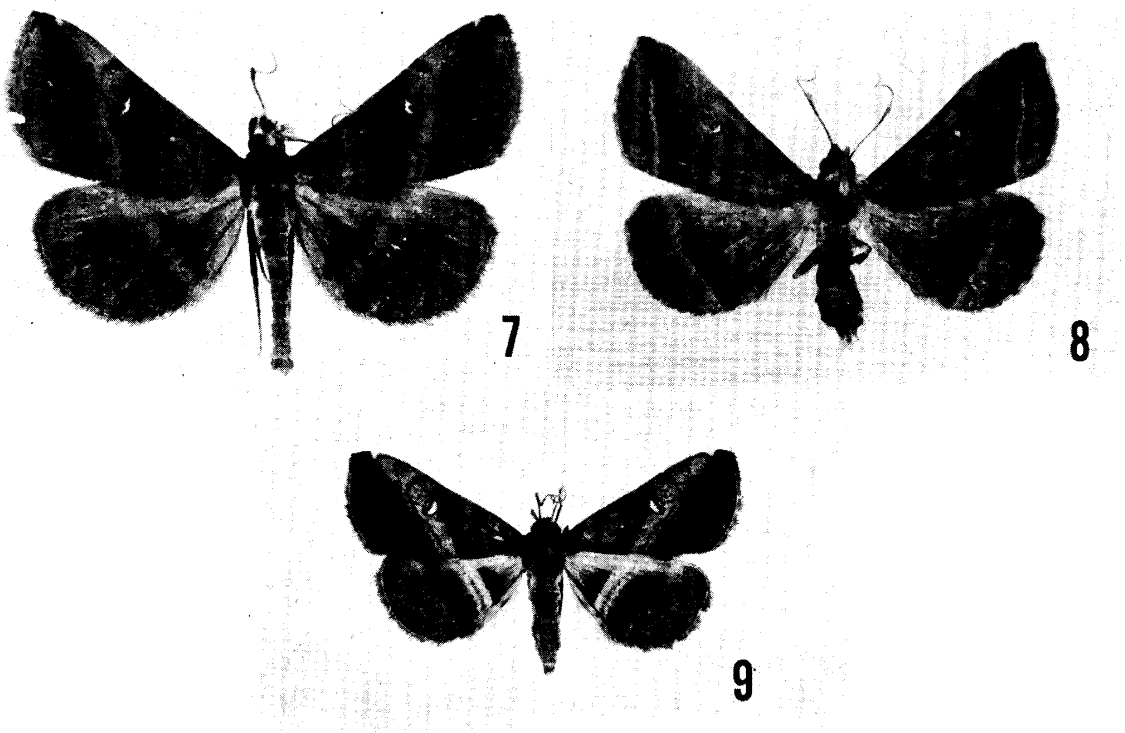
the distal end of 2nd segment and from the base of 3rd segment respectively. Male labial palpus in *nakatanii* n. sp. (Fig. 5) well upcurved over head, without tuft of hairs. Labial palpus in female (Fig. 6) slender sickle-shaped. In male bearing specialized labial palpi, vertex flattened and occiput slightly broadened posteriorly. Vertex of male *nakatanii* n. sp. and of the females of all the species normal in shape. Legs normal in shape in both sexes. Costa of male forewing slightly arcuate internally, with a large wide costal fold from base to beyond middle on the underside; in female without costal fold.

Male genitalia. Uncus slender, slightly swollen ventrally. Tegmen narrow, simple. Vinculum will developed, saccus U-shaped, with a tuft of long slender hairs from membraneous part which is represented by a round mass of sockets of the hairs. Valva weakly sclerotized, rounded at the distal end; costa slightly sclerotized, simple; succulus developed, with a stout process, which is either long or short. Juxta diamond-shaped; transtilla narrow. Aedeagus as long as valva, slightly curved before middle; vesica well scobinate; coecumpenis not developed.

Female genitalia. Papillae anales and 8th abdominal segment moderate. Ductus bursae short, flattened at the anterior portion. Corpus bursae long, almost three times as long as ductus bursae, scattered with micro-spines, with a signum which is a rounded sclerotized patch scobinate with micro-spines. Ductus seminalis arising from posterior portion of corpus bursae, broadened and coiled in base.

Remarks. The phylogenetic relationship between related genera was discussed in my previous paper (Owada, 1978).

The male specialized organs, the brush-organs of labial palpi and the knots of antennae, are not stable for generic characters. In fact, the new species to be described in this paper does not possess those organs. It is also noted that of the three Taiwanese species of *Hadennia* examined by myself, one possesses all the organs, another has only the knots of antennae and the other possesses the brush-organs of labial palpi and lacks the knots of antennae. The other male specialized organ, the costal folds of forewings, is found in all the species from Japan and Taiwan.



Figs. 7–9. Male of *Hadennia* species. —— 7. *Hadennia incongruens* (Butler). —— 8. *Hadennia obliqua* (Wileman). —— 9. *Hadennia nakatanii*, n. sp., paratype.

Key to Species of *Hadennia* from Japan

Based on Wing Pattern

1. Reniform stigma lunulate .... *incongruens*

— Reniform stigma rounded 2

2. Reniform stigma small, external area of subterminal line paler than ground colour .... *obliqua*

— Reniform stigma large, external area of subterminal line not paler than ground colour .... *nakatanii*, n. sp.

Based on Genitalia

1. Male 2

— Female 4

2. Process of succulus very long .... *incongruens*

— Process of succulus short 3

3. Valva almost straight, gradually narrowed towards apex .... *obliqua*

— Valva almost straight on the dorsal edge and smoothly arcuate on the ventral edge .... *nakatanii*, n. sp.

4. Ductus bursae long and narrow, signum small .... *nakatanii*, n. sp.

— Ductus bursae short and broad, signum rather large 5

5. Corpus bursae with many micro-spines except for bottom .... *incongruens*

— Corpus bursae with a few micro-spines in posterior half .... *obliqua*

Hadennia incongruens (BUTLER, 1879)

Bocana incongruens BUTLER, 1879, Ann. Mag. nat. Hist., (5), **4**: 448; LEECH, 1889, Proc. zool. Soc. Lond., **1889**: 566.

Nodaria amurensis STAUDINGER, 1888, Stett. ent. Ztg., **36**: 274; GRAESER, 1889, Berl. ent. Z., **32**: 379; STAUDINGER, 1892, in ROMANOFF, Mém. Lépid., **6**: 609, pl. 13.

Bleptina jutalis: HAMPSON, 1895 (nec WALKER, 1859), Fauna Brit. Ind., Moths, **3**: 45; LEECH, 1900, Trans. ent. Soc. Lond., **1900**: 624.

Nodaria (*Bocana*) *jutalis*: MATSUMURA, 1905 (nec WALKER, 1859), Cat. Ins. Jap., **1**: 112.

Bertula jutalis: WARREN, 1913 (nec WALKER, 1859), in SEITZ, Macrolepid. World, **3**: 426, pl. 72-h; MATSUMURA, 1931, 6000 Illust. Ins. Jap., p. 767; INOUE & SUGI, 1958, Check List Lepid. Jap., (5): 612; OGATA, 1958, in ESAKI *et al.*, Icon. Heteroc. Jap. Col. Nat., **2**: 156, pl. 119, fig. 2509; SUGI, 1959, in INOUE *et al.*, Icon. Ins. Jap. col. nat., **1**: 156, pl. 105, fig. 17.

Bertula jutalis amurensis: BRYK, 1948, Ark. Zool., **41A** (1): 150.

Hadennia incongurens: OWADA, 1978, Bull. natn. Sci. Mus., Tokyo, (A), **4**: 281.

In male, antenna with knot (Fig. 1); labial palpus modified and with tufts of hairs (Figs. 3,4).

♂ (Fig. 7) & ♀. Expanse 26–34 mm. Ground colour of the upperside of body and wings brown tinged with dark purple. On the upperside of forewing, antemedial line dark brown, outwardly rounded; orbicular stigma of a very small yellow dot, indistinct in worn specimens; reniform stigma yellow, lunulate, externally shaded with dark brown; postmedial line dark brown, narrow, from costa, angulate at the outside of reniform stigma and straightly down to middle of dorsum; subterminal line represented by dark brown broad shade, from apex to before hind angle, slightly sinuate, externally with a series of ochreous small dots which are traceable only in fresh examples; terminal line dark brown, interrupted by veins; cilia the same as ground colour. On the upperside of hindwing, median shade dark brown, broad, vanished towards base and costa; postmedial line dark brown, narrow, almost straight; subterminal line ochre, indistinct, internally edged with dark brown broad shade; terminal line and cilia the same as in forewing. Underside of body and wings brown tinged with ochre; markings dull, indistinct, almost of the same pattern as on the upperside, only yellowish discocellular marks of both wings prominent.

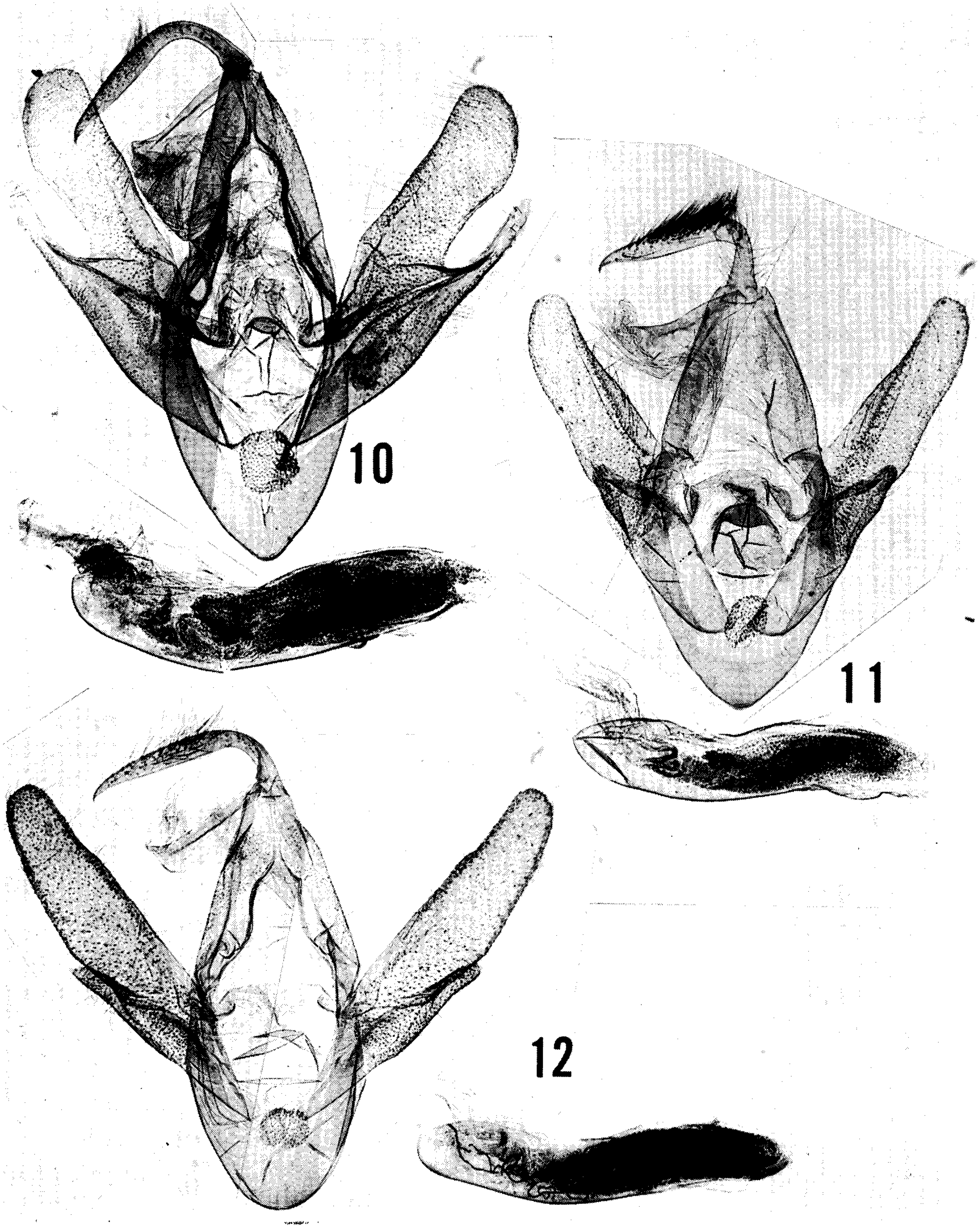
Male genitalia (Fig. 10). Costa of valva slightly angulate; distal end of valva dilated; succulus well developed, distally with a long stout process reaching about 5/6 of valva. Aedeagus rather thick.

Female genitalia (Fig. 13). Ductus bursae broad. Corpus bursae broadest in under middle, with many fine micro-spines except for bottom.

Type-material. Bocana incongruens, "type(s), ♀". Type-locality: Japan. Preserved in the British Museum (Nat. Hist.). Examined by a photograph.

Other material examined. Japan: Hokkaido——1♀, Kamuiwaki, Okushiri Is., 2. VIII. 1967 (Y. Kishida). Honshu——1♂, Matsukawa Spa, Iwate Pref., 3–6. VIII. 1958 (H. Suzuki); 1♂, Nasu-kôgen, Tochigi Pref., 20. VII. 1973 (Y. Kishida); 1♂1♀, Kawarayu, Gunma Pref., 1. VII. 1951 (S. Sugi); 2♂, Usui Pass, Gunma Pref., 22. VIII. 1922 (I. Sugitani); 1♀, Ôwa, Saitama Pref., 4. VII. 1957 (K. Ishizuka); 1♂, Mt. Takao-san, Tokyo Pref., 28. V. 1960 (K. Ishizuka); 2♂, same locality, 1. VI. 1952 (S. Sugi); 1♂1♀, same locality, 2. VI. 1951 (S. Sugi); 1♂, same locality, 8. VI. 1950 (S. Sugi); 2♂, same locality, 15. VI. 1952 (S. Sugi); 1♂, same locality, 25. VI. 1954 (I. Inoue); 1♂, same locality, 15. IX. 1950 (S. Sugi); 1♂, Yashajin Pass, Yamanashi Pref., 3. IX. 1972 (K. Jinbo); 1♀, Karuizawa, Nagano Pref., 17. VI. 1967 (K. Jinbo); 1♂1♀, Hoppo Spa, Nagano Pref., VI. 1924 (I. Sugitani); 4♀, Tera, Ina, Nagano Pref., 30. VI. 1971 (M. Owada); 1♂, same locality, 14–18. VIII. 1971 (M. Owada); 1♂, Todai, Kami-Ina, Nagano Pref., 29. VI. 1971 (M. Owada); 1♂, same locality, 8–11. VII. 1978 (M. Owada); 1♂, same locality, 1. IX. 1970 (M. Owada); 1♂, Ikawa, Shizuoka Pref., 4. VI. 1970 (Y. Nishi); 9♂1♀, same locality, 23–25. VI. 1971 (M. Owada); 1♂, Hatogayu, Ôno, Fukui Pref., 15. IX. 1951 (I. Izaki); 1♀, Kurama, Kyoto Pref., 13. VI. 1925 (I. Sugitani); 1♂, Mt. Makio-san, Izumi, Osaka Pref., 27. V. 1976 (M. Owada); 1♂, Mt. Kojindake, Nara Pref., 27. V. 1976 (S. Nakatani); 2♂, same locality, 3. VIII. 1971 (F. Komai); 1♂1♀, same locality, 14. VIII. 1968 (S. Nakatani); 1♂, Ôsugi-dani, Mt. Ôtô-san, Higashi-Muro, Wakayama Pref., 28. VI. 1975 (S. Nakatani); 3♂, same locality, 1–4. VII. 1978 (M. Owada & Y. Nishi); 1♂, same locality, 23. IX. 1973 (S. Nakatani); 1♂, Kosame-dani, Mt. Ôtô-san, Wakayama Pref., 24. IX. 1972 (S. Nakatani). Shikoku——2♂, Omogo, Ehime Pref., 9–10. VII. 1971 (M. Owada); 1♂, Mt. Ishizuchi, Ehime Pref., 26. VII. 1971 (M. Owada). Kyushu——1♂, Hikosan, Fukuoka Pref., 28–30. V. 1975 (M. Owada); 1♀, same locality, 29. V. 1954 (H. Kuroko); 1♂, same locality, 16. VI. 1950 (A. Habu); 1♂, same locality, 3. IX. 1975 (K. Setoya); 1♂, Nukumizaka Pass (700 m), Uemura, Kumamoto Pref., 1. VIII. 1970 (H. Fukuda). Tsushima Is.——2♂, Mt. Ariake, 5. IX. 1973 (K. Ueda *et al.*). Korea: 1♂, Mt. Sudo-san, Kyongsanpuk-do, 9–12. VII. 1971 (K. Yamagishi).

Distribution. Japan (Hokkaido, Honshu, Shikoku, Kyushu and Tsushima Is.), Korea, Ussuri and Amurland.

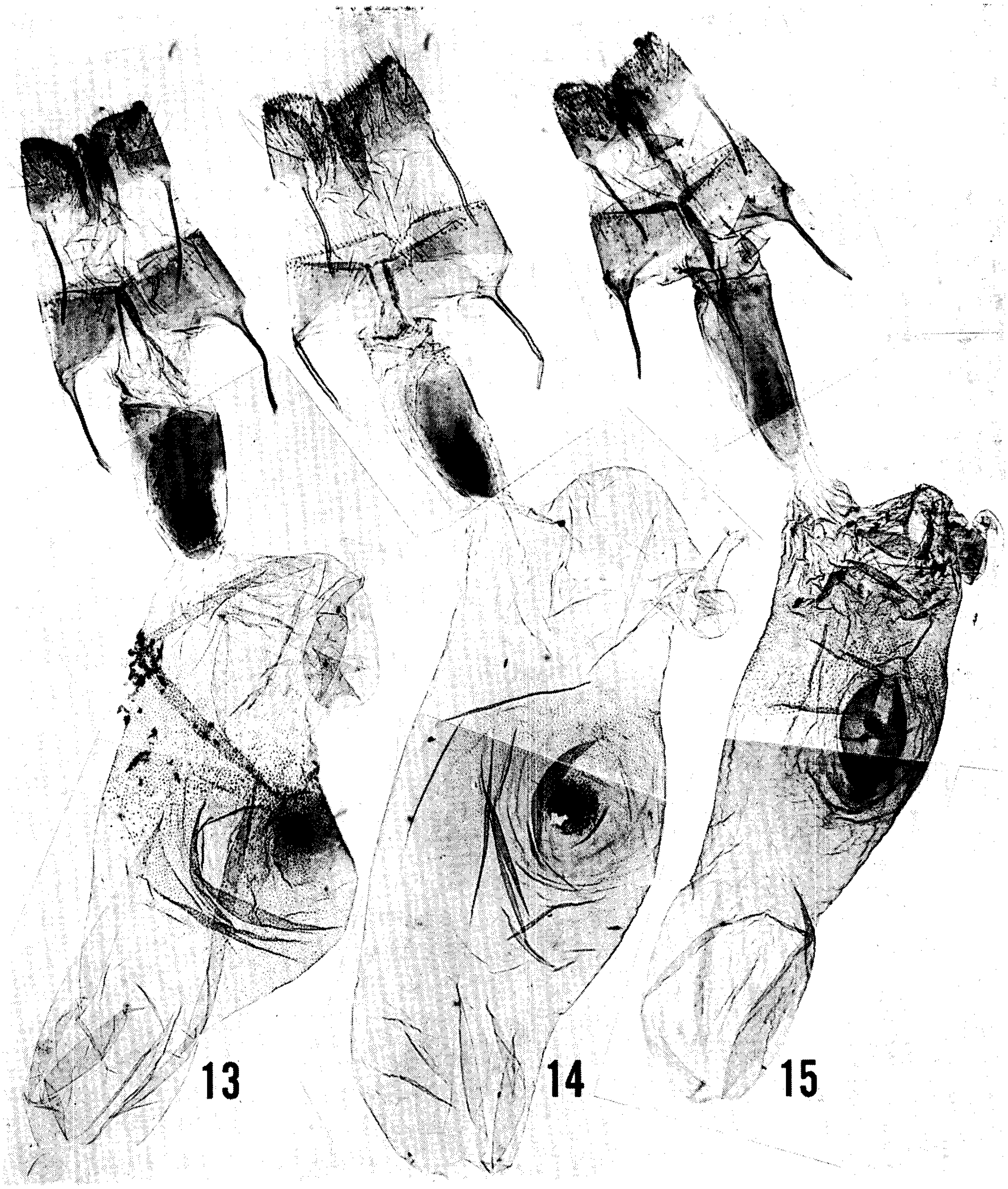


Figs. 10–12. Male genitalia. —— 10. *Hadennia incongruens* (Butler). —— 11. *Hadennia obliqua* (Wileman). —— 12. *Hadennia nakatanii*, n. sp., paratype.

Hadennia obliqua (Wileman, 1911)

Nodaria obliqua Wileman, 1911, Trans. ent. Soc. Lond., **1911**: 255, pl. 31, fig. 15.

Bertula hisbonalis: Warren, 1913 (nec Walker, 1859), in Seitz, Macrolepid. World, **3**: 426; Matsu-



Figs. 13–15. Female genitalia.——13. *Hadennia incongruens* (Butler).——14. *Hadennia obliqua* (Wileman).——15. *Hadennia nakatanii*, n. sp., paratype.

Mura, 1931, 6000 Illust. Ins. Jap., p. 767; Inoue & Sugi, 1958, Check List Lepid. Jap. (5): 612; Ogata, 1958, in Esaki *et al.*, Icon. Heteroc. Jap. Col. Nat., 2: 196, pl. 119, fig. 2510; Sugi, 1959, in Inoue *et al.*, Icon. Ins. Jap. col. nat., 1: 156, pl. 105, fig. 16.

Bertula obliqua: Warren, 1913, in Seitz, Macrolepid. World, 3: 426, pl. 75-b; Inoue & Sugi, 1958, Check List Lepid. Jap., (5): 612.

Hadennia obliqua: Owada, Bull. natn. Sci. Mus., Tokyo, (A), 4: 281.

In male, antenna with knot; labial palpus modified, bearing tufts of hairs.

♂ (Fig. 8) & ♀. Expanse 22–31 mm. Ground colour of the upperside of body and wings brown, more tinged with purple than in *incongruens*. On the upperside of forewing, antemedial line, median shade and postmedial line very weak, hardly tracheable; orbicular stigma of a dark brown small dot; reniform stigma yellow, rounded, smaller than in *incongruens*; subterminal line whitish purple, straight, internally shaded with dark brown; outer area of subterminal line whitish; terminal line a series of dark brown dots between veins. On the upperside of hindwing, markings of inner area of subterminal line indistinct; subterminal line whitish purple, straight, vanished towards costa, internally edged with dark brown shade; outer area of subterminal line the same as in forewing. Underside of wings almost the same as in *incongruens*, but the lines are more indistinct and discocellular marks smaller.

Male genitalia (Fig. 11). Valva almost straight, gradually narrowed towards apex; succulus less developed than in *incongruens*, with short process reaching middle of valva. Aedeagus a little thinner than in *incongruens*.

Female genitalia (Fig. 14). Similar to *incongruens* in general appearance, but the sclerotized plate of ductus bursae is narrower, the scobination of microspine is not so fine, and the signum is larger.

Type-material. *Nodaria obliqua*, holotype ♂, labeled "Takakuma-yama/ Prov. Osumi [Kyushu]/15. IX. 1895/A.E. Wileman," by original designation as "type," preserved in the British Museum (Nat. Hist.). Examined by a photograph.

Other material examined. Japan: Honshu——1♂, Mt, Takao-san, Tokyo Pref., 13. V. 1950 (H. Inoue); 1♂, same locality, 17. V. 1963 (K. Jinbo); 1♂, same locality, 21. V. 1962 (T.N.); 2♂, same locality, 25. V. 1959 (H. Inoue); 1♂, same locality, 22. VI. 1963 (K. Jinbo); 1♂, same locality, 21. VII. 1963 (K. Jinbo); 1♂, same locality, 28. IX. 1963 (K. Jinbo); 1♂, Ôdaru, Nashimoto, South Izu, Shizuoka Pref., 12. IV. 1961 (A. Suzuki); 1♂, same locality, 7. VI. 1959 (H. Inoue); 2♂, same locality, 5. VII. 1959 (H. Inoue); 1♂, same locality, 8. VII. 1962 (S. Sugi); 3♂, same locality, 12–13. VII. 1958 (S. Sugi); 1♂, same locality, 26. VII. 1959 (S. Sugi); 1♀, same locality, 29–30. VII. 1958 (H. Inoue); 2♂1♀, same locality, 2–4. VIII. 1957 (S. Sugi); 1♂, Katsuta, Haibara, Shizuoka Pref., 19. V. 1972 (T. Sakurai); 2♂, same locality, 3–7. VII. 1972 (T. Sakurai); 1♂, same locality, 28. VIII. 1972 (T. Sakurai); 2♂, Tsubaki Spa, Wakayama Pref., 8. VII. 1973 (K. Tanaka); 1♀, Inari-chô, Tanabe, Wakayama Pref., 24. IV. 1971 (S. Nakatani); 1♂, Taiji, Tanabe, Wakayama Pref., 1. V. 1971 (S. Nakatani); 1♂, same locality, 28. VII. 1971 (S. Nakatani); 1♂, Kii-Shinjô, Tanabe, Wakayama Pref., 26. IV. 1970 (S. Nakatani); 1♂, same locality, 28. VI. 1970 (S. Nakatani); 1♂, Esunosaki, Susami, Nishi-Muro, Wakayama Pref., 23. VIII. 1972 (S. Nakatani); 2♂, Mt. Myôhôzan, Higashi-Muro, Wakayama Pref., 28–29. VI. 1978 (M. Owada & Y. Nishi); 8♂, Ôsugidani, Mt. Ôtôsan, Higashi-Muro, Wakayama Pref., 1–4. VII. 1978 (M. Owada & Y. Nishi); 1♂, same locality, 22. VII. 1975 (S. Nakatani); 1♂, same locality, 2. VIII. 1975 (S. Nakatani); 1♂1♀, same locality, 23. IX. 1973 (S. Nakatani). Shikoku——1♂, Nametoko, Kita-Uwa, Ehime Pref., 16. VII. 1971 (M. Owada); 1♂, Okino-shima Is., Sukumo, Kochi Pref., 17–18. VII. 1971 (M. Owada); 2♂, Befu, Kami, Kochi Pref., 22–23. VII. 1971 (M. Owada); 2♂1♀, Sakihama, Muroto, Kochi Pref., 3. V. 1978 (T. Masui). Kyushu——1♂, Hikosan, Fukuoka Pref., 20. IX. 1954 (H. Kuroko). Yakushima Is.——2♂, Mt. Aiko-dake, 26. VII. 1974 (H.

INOUE). Amami-ôshima Is.——1♂, Motocha Pass, Naze, 17. III. 1975 (Y. FUJIMAKI); 3♀, Hatsuno, 11–13. VIII. 1977 (R. SATO); 5♂4♀, Mt. Yuwan-dake, 15–17. VII. 1977 (R. SATO). Okinawa Is.——2♂, Yona, 18–21. X. 1973 (M. OWADA). Ishigaki Is.——1♂, Mt. Banna-dake, 30. III. 1973 (Y. IMAMURA); 1♂, same locality, 20. IV. 1977 (S. KONDO); 1♂, same locality, 30. V. 1973 (S. KONDO). Iriomote Is.——1♂, Mt. Ushiku, 7–10. XI. 1963 (G.A. SAMUELSON).

Distribution. Japan (Southwestern Honshu, Shikoku, Kyushu, Yakushima Is., Amami-ôshima Is., Okinawa Is., Ishigaki Is. and Iriomote Is.).

Hadennia nakatanii sp. nov.

Hadennia sp.: OWADA, 1978, Bull. natn. Sci. Mus., Tokyo, (A), 4: 281.

Very closely similar to *H. incongruens* and according to its description in every detail, but distinguished from it by the following respects:——In male, antenna without knot (Fig. 2); labial palpus not modified, without tufts of hairs (Fig. 5). Smaller in size, expanse 23–26 mm. On the forewing, orbicular stigma minutely dark brown, while it is yellow in *incongruens*; reniform stigma rounded and divided into two parts by discocellular dark brown line, while it is lunular in *incongruens*; black triangular mark present at apical portion, while it is absent in *incongruens*. Terminal lines of both wings continuous, not interrupted as in *incongruens*.

Male genitalia (Fig. 12). Valva almost straight on the dorsal edge and smoothly arched on the ventral edge; succulus less developed, with short process, which is slenderer than that of *obliqua*, reaching middle of valva. Aedeagus rather slender.

Female genitalia (Fig. 15). Ductus bursae long and narrow; corpus bursae rather slender, scattered with micro-spines in middle; signum small.

Holotype. ♂, labeled "Japan/Wakayama Pref./Higashi-Muro/Mt. Oto-san/Osugi-dani/1–4. VII. 1978/M. Owada & Y. Nishi." Presreved in the National Science Museum, Tokyo.

Paratypes. Honshu——16♂11♀, same data as holotype; 1♂, Kosame-dani, Mt. Ôtô-san, Wakayama Pref., 24. IX. 1972 (S. NAKATANI); 1♀, Kii-Shinjô, Tanabe, Wakayama Pref., 13. VI. 1969 (S. NAKATANI); 1♂, Kawayu Spa, Higashi-Muro, Wakayama Pref., 2. VI. 1971 (M. OWADA); 1♂1♀, Ôdaru, Nashimoto, South Izu, Shizuoka Pref., 7. VI. 1959 (H. INOUE); 1♂, same locality, 8. VI. 1958 (S. SUGI); 1♂, same locality, 13–14. VI. 1959 (S. SUGI); 1♀, same locality, 30. VI. 1957 (S. SUGI); 1♂, same locality, 8. VII. 1962 (S. SUGI); 1♀, same locality, 10–12. VIII. 1959 (H. INOUE); 1♀, same locality, 24. VIII. 1953 (S. SUGI); 1♂, Nakatsugawa, Awaji-shima Is., Hyogo Pref., 11. VIII. 1972 (K. TOBI); 1♂, Mt. Inari-yama, Okayama, Okayama Pref., (S. MAKIMOTO); 1♀, Shôda, Niimi, Okayama Pref., 16. VIII. 1965 (S. MAKIMOTO). Shikoku——1♂, Hitotsuuchi, Sionoe, Kagawa Pref., 10. IX. 1972 (T. MASUI); 4♂, Okuno, Shionoe, Kagawa Pref., 19. VI. 1974 (T. MASUI); 1♀, Dôno, Shionoe, Kagawa Pref., 22. VIII. 1974 (T. MASUI); 1♀, Kônotaki, Kida, Kagawa Pref., 6. VI. 1977 (T. MASUI); 1♀, Fujio-jinja, Takamatsu, Kagawa Pref., 10. X. 1977 (T. MASUI); 1♂, same locality, 15. X. 1978 (M. OWADA); 1♂, Nametoko,Kita-Uwa, Ehime Pref., 16. VII. 1971 (M. OWADA). Tsushima Is.——4♂, Mt. Ariake, 5. IX. 1973 (K. UEDA *et al.*); 1♀, Kônokiyama, 28. IV. 1973 (T. WATANABE); 1♂, Taterayama, 2. X. 1973 (T. WATANABE); 1♀, Aré, 7. IX. 1973 (T. WATANABE).

Distribution. Japan (Southwestern Honshu, Shikoku and Tsushima Is.).

This new species is named after the late Mr. Shinji NAKATANI, 1942–77, who was a pioneering resarecher of the moth-fauna of Wakayama Prefecture.

Distribution of the Japanese Species of *Hadennia*

Based upon the material used in this study as well as upon the published data on the Japanese moths, the known localities of the three *Hadennia* species are plotted on the accompanying sketch maps (Fig. 16, 17). As will be readily understood, each species shows its own distributional pattern, though the ranges of the three overlap each other in certain areas.

Hadennia incongruens is widespread in the main islands of Japan, but seems to be confined to mountainous areas in southwestern Honshu, Shikoku and Kyushu. It can be regarded

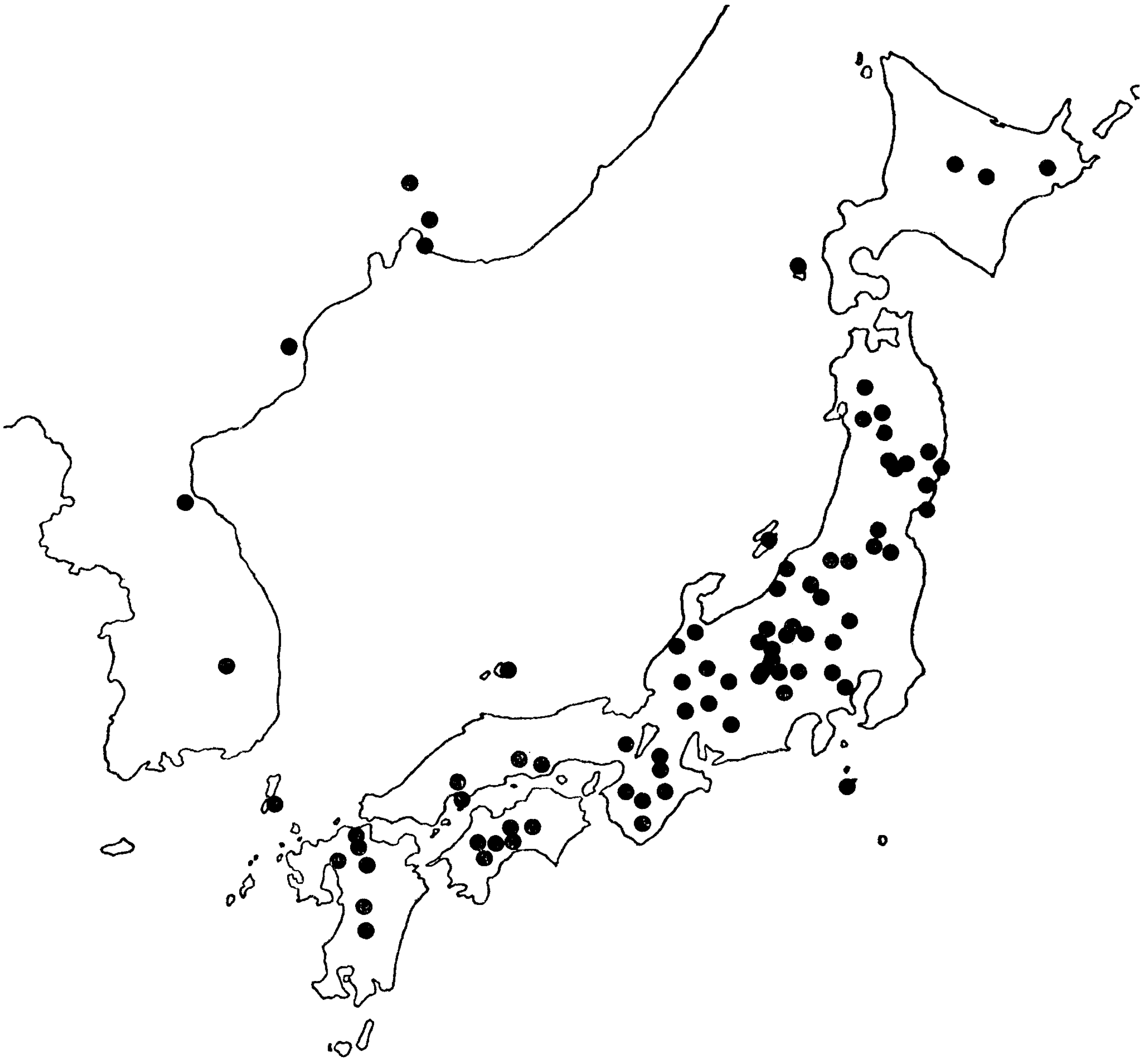


Fig. 16. Distribution map of *Hadennia incongruens* (BUTLER).

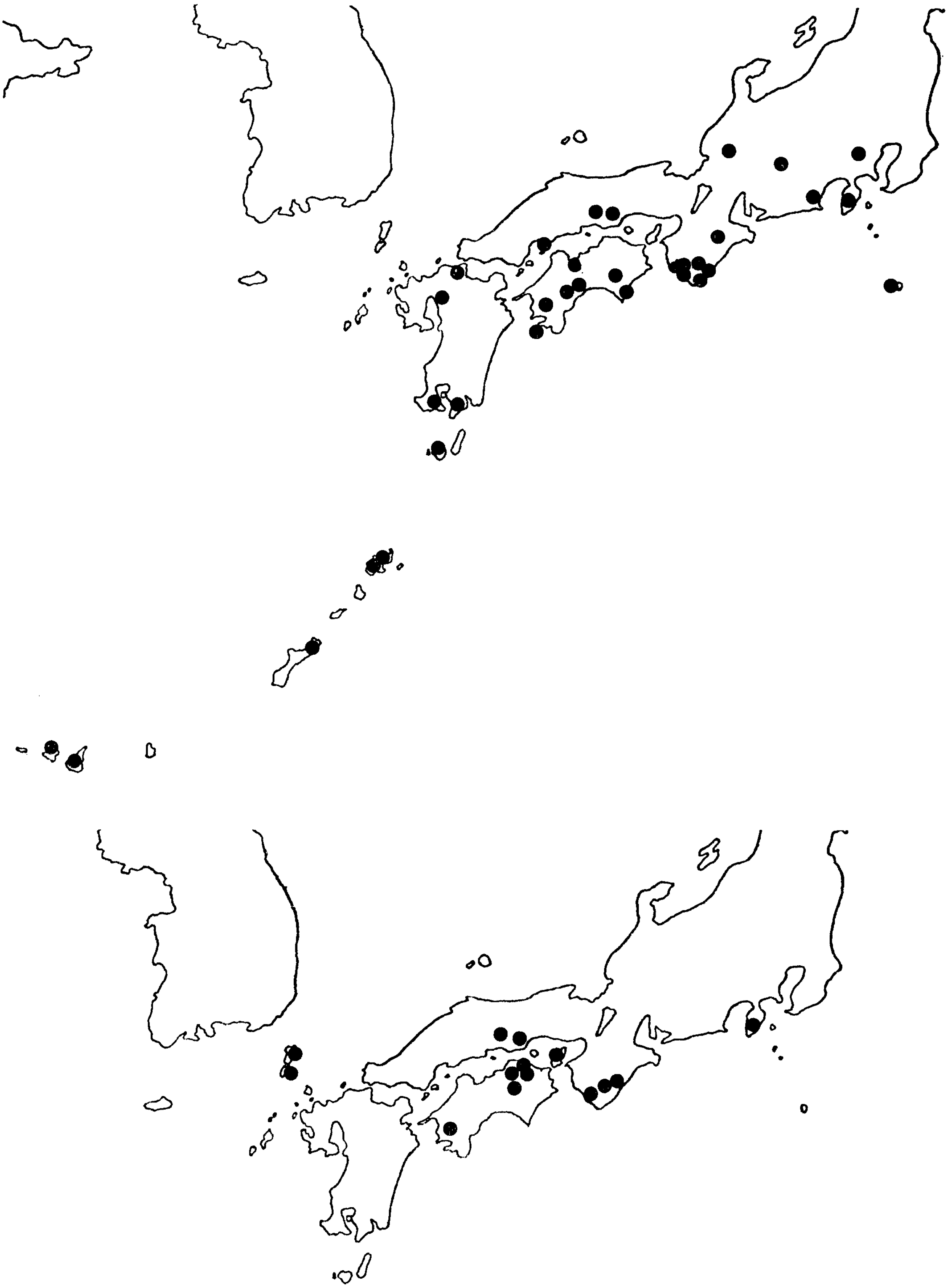


Fig. 17. Distribution maps of *Hadennia obliqua* (WILEMAN), above; and *Hadennia nakatanii*, n. sp., below.

as an inhabitant of deciduous broadleaved forests. The other two, *H. obliqua* and *H. nakatanii*, both of which occur in evergreen broadleaved forests of southwestern Japan, are seemingly sympatric in the mainland. On the accessory islands, however, the mode of distribution is evidently different between the two. The former extends its distribution to the southernmost islands of the Ryukyus, but does not occur in the Tsushima Islands lying between Kyushu and Korea. It seems to prefer lowlands or coastal areas and to adapt itself to oceanic climate. On the contrary, *H. nakatanii* occurs in the Tsushima Islands and does not spread in the Ryukyus. It inhabits well developed laurel forests, in which the environment is dark and humid. An ecological barrier seems to exist between *H. obliqua* and *H. nakatanii*. A similar phenomenon was noted by SUGI (1971) on the evergreen *Quercus* feeders of *Catocala*, the Underwings, which are roughly separated into three groups, that is, the forms occurring in the upper laurel forest (*C. hyperconnexa*), in the lower one (*C. intacta*), and in the coastal one (*C. kuangtungensis*).

Judging from the existing patterns of distribution, it can be surmised that the three Japanese species of *Hadennia* may have had allopatric ranges in the past. In an original state, the Japanese Islands are said to have been largely covered with laurel forests. By continuous human activities, those primeval forests were gradually changed into secondary ones, whose predominant plants were deciduous broadleaved trees and plantation of conifers. In the process of these environmental changes, *H. incongruens* may have invaded the secondary vegetations, while destruction of the ecological barrier between *H. obliqua* and *H. nakatanii* in certain parts of their ranges may have brought about partial sympatry of them in the mainland of Japan. One of the examples is the Kii Peninsula, where all the three species can be obtained in the same place, Ôsugi-dani on Mt. Ôtô-san being the good example.

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要約

ハナマガリアツバ属 *Hadennia* のガは日本に3種を産する．先に公表した論文で，わたしはこれらのうち

の2種の学名を便宜的に正し，1種を未記載のまま残しておいた（Owada, 1978）．1978年6～7月に，わたしは紀伊半島南部で採集を行ない，本属の種を多数採集したが，その大部分はこの未記載種にほかならなかった．この機会に，日本に産する本属のガをまとめ，その分布型を比較し，とくに紀伊半島における3種の混生の要因について考察した．

本属は，雄の下唇鬚が特化するグループに属する．近縁な属との関係は前報（1978）で考察した．しかし，このたび新種として記載したヒメハナマガリアツバ（新称）は，その雄の下唇鬚が特化せず，本属の他の種にみられる触角の特化器官も失なわれている．また，台湾産の3種のこれら器官の保有状態から推察して，雄の下唇鬚および触角の特化器官は，本属では安定した形質とはいえないことがわかった．

日本産3種の学名は次のとおりである．

Hadennia incongruens（Butler）ハナマガリアツバ．分布：日本（北海道，本州，四国，九州，対馬）；朝鮮，アムール，ウスリー．

Hadennia obliqua（Wileman）ソトウスアツバ．分布：日本（本州南西部，四国，九州，八丈島，屋久島，奄美大島，沖縄島，石垣島，西表島）．

Hadennia nakatanii Owada, n. sp. ヒメハナマガリアツバ（新称）．分布：日本（本州南西部，四国，対馬）．

ヒメハナマガリアツバは，ハナマガリアツバによく似ているが，小型であること，雄の下唇鬚および触角が特化していないこと，環状紋が黒褐色の小点であること，腎状紋が円形であること，前翅頂の下に三角の黒紋を有すること，外縁線が連続した細い線となることなどの点で区別できる．

日本の *Hadennia* 3種は，木州南西部，四国，九州などで分布が重複するが，それぞれの分布型はかなり異なっている．ハナマガリアツバは温帯性落葉広葉樹林帯を中心に広く分布し，残りの2種は照葉樹林帯に分布する．しかし，ヒメハナマガリアツバは発達した照葉樹林にのみ生息し，ソトウスアツバは海洋性気候により適応しているようで，前種の分布しない琉球列島の南端まで分布が延びている．照葉樹林帯に生息する近縁な種のすみ分けは，杉（1971）により，常緑カシ類を食う *Catocala* 3種でも指摘されている．

日本の *Hadennia* 3種は，過去においては，より異所的な分布をしていたのであろう．照葉樹林の崩壊とともにできあがった二次林にハナマガリアルバが侵入し，いっぽう，照葉樹林内の環境の変化に伴なって生態的隔離が解かれたことによりソトウスアツバが内陸部に侵入可能となったため，現在みられる混生地帯ができたものと推定される．その好例が紀伊半島にみられる．そこには大塔山大杉谷のように3種が同時に採集される地域がある．

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